THE ANALYST.

FEBRUARY, 1893.

PROCEEDINGS OF THE SOCIETY OF PUBLIC ANALYSTS.

THE ANNUAL MEETING of the Society was held on Wednesday evening, January 4th, at the Chemical Society's Rooms, Burlington House, Piccadilly, Mr. Otto Hehner (the retiring President) in the chair.

The minutes of the last meeting having been read by the Secretary, and confirmed, the following gentlemen were elected as members:—Messrs. Arthur Frederick Morgan, F.C.S., analytical and consulting chemist, Newport, Mon.; Cresacre George Moor, B.A., F.C.S., analytical chemist, London; Thomas Shortbridge Tweedie, analytical chemist Annan; and John Francis Liverseege, F.I.C., Birmingham, was elected an associate.

Messrs. W. C. Samuel, M. J. Sheridan, R. T. Thomson, and J. White were nominated as members.

In the absence of the Treasurer, through illness, Dr. Dyer presented the year's accounts. The balance-sheet was ordered to be printed and circulated in the usual way.

On the motion of the President, the Secretaries were requested to convey the thanks of the Society to the Chemical Society for the continued use of their rooms.

The retiring President then delivered the following Address:—

PRESIDENT'S ANNUAL ADDRESS.

GENTLEMEN,

It is a matter of some difficulty to compress within the short limits of the address which it is my privilege and pleasure to submit to you, an account of the many matters which have, during the past year, agitated the members of the Society and that section of the public which is interested in the working of the Sale of Food and Drugs Act. Never, since the passing of that Act, has it been subjected to so much comment and criticism as during the year 1892, and, indeed, many circumstances have combined to render it the object of discussion. We Public Analysts must welcome this attention which the Act, and, therefore, Public Analysts themselves, have received, in the full hope that, by any investigation or inquiry which may, and which, I hope, will be, instituted, some measure of recognition of the services of Public Analysts to the public will at length result.

We have to deplore the loss of four members by death during the past year, namely, of our most distinguished honorary member, Professor A. W. Hofmann, and three ordinary members, Dr. Theophilus Redwood, Mr. Norman Tate, and Dr. Tomkins. It is proper that I should further refer to the death of Dr. Albert Bernays, who, although not a member of our Society at the time of his death, was one of its founders and for years belonged to the Society. Almost up to the time of his death he was Public Analyst for several important metropolitan districts; and when the Society's Milk Committee went through its arduous labours, he most cheerfully and kindly assisted us.

It is not my intention on the present occasion to enlarge upon the loss which our profession and the whole world has sustained by the death of Dr. A. W. Hofmann. His name is a household word with every chemist, and will ever be written in the history of our science. I only desire to recall the fact that at one time he took a deep interest in the working of our Food Act. He was one of the commissioners appointed by the German Government to frame a Food Act for the German Empire, an Act which, though based upon our Act as a model, is in one important respect, to which I shall have to refer in the progress of this address, an improvement upon our own law, namely, by the institution of an imperial scientific authority, the Reichs-Gesundheits-Amt, in Berlin, which is the supreme advising authority in all matters concerning the Food Laws.

Dr. Theophilus Redwood, who died at a ripe old age, was the first president of the Society of Public Analysts, and shared with the late Mr. Wigner and the late Mr. Heisch, and with Dr. Muter, Dr. Dupre, and Mr. Allen, and a very few others, the arduous labour of collecting and of more or less binding together the heterogeneous elements which at first made up the Society of Public Analysts, and of doing whatever was possible to put the Food and Drugs Bill into the approximately workable shape which it ultimately assumed. The early history of the Society of Public Analysts was, as you all well know, full of troubles, and among these not the least was the resignation of Dr. Redwood. But after the period of the infancy of our Society had passed, and peace, as we happily enjoy it to-day, was established, we were all very glad to welcome Dr. Redwood back again as one of our members.

Mr. Norman Tate, of Liverpool, was for some years a vice-president of our Society. His work lay outside the ordinary occupation of the Public Analyst, but he always took a lively interest in our Society, and frequently attended our meetings; while those who came into contact with him more intimately will always remember the charm of his manner and his geniality.

Dr. H. Tomkins was Public Analyst and medical officer of health for the Borough of Leicester. He never practised as a physician, but devoted his life to sanitary science and preventive medicine. In private life Dr. Tomkins was kindly and amiable. He was not widely known; he chose rather to occupy his time entirely with subjects bearing upon his special work.

As to the general progress of the Society during 1892, we have every reason to be satisfied. We had at the time of the last annual meeting a total of 203 on our list, namely, 9 honorary and 172 ordinary members, and 23 associates. We have lost one honorary member, but the previous number of nine was made up by the election of our valued friend, Dr. P. Vieth, on his departure for Germany; while we have elected twenty new members, bringing the ordinary members up to 188. Four associates resigned or became members and we elected nine new ones, so that we now have twenty-five, or a total of all members of 222—nineteen more than last year. I must at the same time express my regret that there is every probability that several members will shortly be removed from our list on account of non-payment of their subscriptions, and I take this opportunity of begging the members to be a little more punctual in their payments, the secretarial work being materially increased by continual reminders which ought not to be necessary.

As regards our financial condition, you will have heard with gratification that, in spite of the heavy expenditure upon our Journal, we are yet some forty pounds better off than we were twelve months ago.

As regards the ANALYST, I hope all members appreciate the labour which has been bestowed upon it. It has been full of matter valuable to the Public Analyst and the Analytical Chemist and would have contained still more if the limited space of the paper had not necessitated the keeping out of a good many abstracts which, properly speaking, should have found a place in it. This difficulty will, in future, be to some extent removed by the increased size of the Journal, but the present increase is merely tentative, and is, I hope, only the precursor to still further enlargement. The enhanced price of the Journal will not, I think, be grudged by any subscriber, nor will any fault be found with the Publication Committee for deciding to materially advance the price of the back volumes, of which only very few are left. The labours of the sub-editor, Dr. W. J. Sykes, have often been considerable, and the Society owes him special thanks for the able and cheerful manner in which he has looked after the ANALYST. It appears very desirable to me that a general index should shortly be made of all the matter contained in the volumes of the ANALYST.

During the year, 43 papers were read at the meetings of the Society, and this is the largest number which has yet been recorded, being an advance of 18 upon the previous year. These papers were the work of 25 members. Thus one member out of every seven brought forward the result of some research, an indication of the great interest which is taken in the working of the Society. It seems, at last, as if the constant admonition of the successive Presidents to the younger members to come forward with a record of their experiences in the many branches of analytical work, was bearing fruit. I doubt whether any other scientific society of this country can boast of so satisfactory a record of work. Nine papers or notes were read by Mr. H. D. Richmond, four by myself, three by Mr. Stock, two each by Messrs. Allen, Dyer, Cassal, Heaton, Sykes, Leffmann and Smetham, and one each by Messrs. Embrey, Fisher, Gill, Leather, Lowe, Macfarlane, Moor,

Skertchly, Taylor, Teed, Stokes and Vieth. Although the year has not brought forth any paper of paramount importance, material advances have been made in several directions. In spite of this satisfactory record, I cannot help once more expressing the disappointment which I cannot but still feel that so many, in fact the majority, of members, never come before the Society with papers, although the observant analyst must almost daily come into contact with problems that require original research. I cannot think that there are any educated chemists, especially practical analysts, who do not daily recognise how much yet remains to be done and how little we really know, and who do not make honest efforts to throw here and there a little light into the dark corners which require exploration. It would be a useful work to point out, were it not obvious to every worker, in which directions useful labour might and should be bestowed. Even in a subject so widely thrashed out as that of milk, much remains to be done, since we cannot distinguish between milk naturally poor and that artificially let down by watering or skimming. I cannot help thinking that there *must* be differences, say, that the casein must be physically affected by extraneously added water. In butter, far more still is undone. Many ingenious but unsuccessful attempts have been made to elucidate its nature, and to show the differences between it and other fats. The differences established were sufficient when it was merely a question of differentiating between pure butter and unmixed other fat, but at the present time, where the addition of even five per cent. of margarine to butter pays the mixer very well indeed, the methods at our command are entirely insufficient. Yet none who has occupied himself with butter-research can doubt that there *are* essential differences between butter-fat and margarine, which differences should enable us to detect the addition of the smallest amount of the latter to butter. Absolute difference in constitution must be looked for, and not merely relative difference, as has been the case hitherto. In a matter apparently so simple as the estimation of chicory in coffee-mixtures, there is a field for useful and important research. It behoves us to point out at the present time, when legal limits are proposed to be fixed by Act of Parliament for coffee and chicory mixtures, that it is in the present state of knowledge quite impossible to say for certain within 5 per cent. more or less, or 10 per cent. altogether, how much chicory a certain mixture may contain. Both coffee and chicory vary far too much in composition, as regards almost every one of the constituents upon which the analyst usually relies, to allow of anything like an absolutely accurate determination. These differences were good enough while it was not a matter of very much consequence to arrive at the exact composition, and where no injustice was the result of a more or less erroneous report, so long as the fact of admixture of chicory was really proved beyond doubt. But when the analyst is called upon, as he may shortly be, to say whether a certain sample contains 49 per cent. of chicory or 51 per cent., the former percentage being legal, the latter illegal, it must be at once acknowledged that our knowledge fails. There can be but one way to get at these small differences, and that is, the absolute separation of the coffee from the chicory by mechanical means, and their

separate analysis. Similar remarks might be applied to our knowledge of cocoa, mustard, all the spices, and every natural article. Then there is the very large field of drugs, of the variation in chemical composition of which very little indeed is known from the point of view of the Public Analyst. Excepting a limited number of *chemical* drugs, as I may call them, the whole pharmacopœia is a dark continent to the chemist. There is hardly an extract or a tincture of the pharmacopœia that is analysable, except in the very crudest manner. I strongly hold that it is the duty of the State to see that officers appointed under one of its laws shall also be furnished with the means of carrying out their duties. Yet the authorities who composed that remarkable work, the "British Pharmacopœia," appear to have been utterly ignorant of the very articles which they admit into their pharmaceutical Bible, and the unfortunate analyst is expected to do that which the authors of the "Pharmacopœia" themselves have carefully avoided. Why, in the present state of knowledge, the analyst should be expected to pronounce definitely upon, say, a sample of compound tincture of rhubarb, or of lobelia, or of hops, or of pellitory, or of scores of others which may be sent to him by an Inspector under the Food and Drugs Act, or on any medicine or mixture of medicines, none of which may have an active or characteristic ingredient, or whose ingredients vary within wide and undefined limits, is more than I can comprehend. Yet such impossible work may lie within our province. If we had a Government fairly intelligently advised in such matters, such a Government would see that the analyst's duties should be practicable. The "Pharmacopœia" itself should by rights contain exact definitions, not only for the pharmacist, but for the chemist, of the articles it includes, and the State should give the means whereby they could be tested. It would be as absurd to send out an army without arms and boots and clothes, as to appoint the army of public analysts without giving them the weapons wherewith to fight the enemies of pure food and drugs. In Germany there is the Reichs-Gesundheits-Amt, that more or less supplies the necessary weapons, but here we are expected, for the beggarly fees which we receive, not only to do the routine work of analysing and giving an opinion based on the results, but also to work out our methods of analysis, no matter at what expenditure of labour and money, time and thought. And when satisfactory methods have been worked out, does a grateful country thank the zealous officer, who thus gives his brains and time, energy and money to the public without even asking for a recompense? No; we all know that every magistrate or sheriff sits in judgment over us, declaring, as happened quite lately in Scotland and also in England, that he knew as much about the merits of the lactometer in comparison with chemical analysis as the analyst himself. And do the Authorities which are set immediately above us—Somerset House and the Local Government Board—help in furnishing us with our fighting weapons? Again, we all know that this is not only not the case, but that every obstacle is placed in our way, and every means of discouragement adopted. And yet, I hope that Public Analysts in general and this Society in particular, will not swerve from the path they have adopted, and which has already, in spite of all, led to great and good results. There are remedies for the

present state of things, which I will venture later on in this address to suggest to you and which I hope will be taken into serious consideration by those in authority.

But, apart from purely public analyst work, untilled fields surround us and call for labour. For many years the chemist has been satisfied, in analysing animal and vegetable products, to split them up into broad groups of constituents; such as oil, that is, ether extract; albuminous matter, that is, nitrogen multiplied with a more or less arbitrary figure; acidity, that is, standard acid used multiplied with another arbitrary figure; and so on. Surely the time has come when such crude distinctions should be abandoned and an endeavour made to obtain definite scientific information. Each of the divisions of matters would afford a life-work to a number of chemists. But it would carry me altogether outside the limits which your patience and my time set me, were I to enlarge upon these almost untrodden fields. Once more I appeal to our members—and the Society is not only a Society of Public Analysts, but of Analytical Chemists—to see that they progress with the times. Routine chemists are not wanted; really scientific thought and labour are imperatively necessary. The time of bottle-washer-chemistry has gone by, never to return.

Your Council have had before them during the past year a number of matters of great importance to Public Analysts. We were threatened with a Bill to amend the Sale of Food and Drugs Act, introduced by Dr. Cameron, which, if it had passed without alteration, would have brought the Food Acts to a definite stop. It was proposed in the Bill that every invoice given by one trader to another should be considered a warranty under the Act. But inasmuch as the Act does not render the prosecution of the giver of the warranty or invoice-warranty compulsory, and no prosecution of a giver of any warranty has ever, so far as I know, taken place, every fraudulent vendor would have produced in court a paper exonerating him, and incriminating nobody. The Council interviewed Dr. Cameron, and recommended that Public Analysts should embody protests against the introduction of such a principle into his Bill, in their quarterly reports to their authorities, and a number of County Councils saw the danger and prepared themselves to take every step in their power against such a Bill passing into Law. I am glad to think that Dr. Cameron has since seen proper to amend his Bill in this direction. The Bill also contained clauses regulating the sale of mixtures of coffee and chicory, clauses which were quite unworkable, and the mischievous tendency of which was promptly pointed out by the President of the Local Government Board in an interview with representatives of the coffee trade.

During the year there took place some deliberations of a Departmental Committee of the Board of Agriculture, on the subject of passing an adulteration Act concerning manures and feeding stuffs. Several members of the Society gave evidence before a Committee of the House of Commons, with a view of preventing an Act analogous to the Food and Drugs Act being passed, and I am glad to think that the Committee's report is opposed to the Agricultural Adulteration Act. Extensions of the Food Acts

are certainly most desirable, as has been pointed out years ago by Mr. Allen and Mr. Cassal, but the whole Food Act requires revision before Public Analysts could consent to load themselves with additional duties on the same conditions as those imposed by the parent Act.

Representations have been made by the Council to the Local Government Board against the very unfortunate practice of some Local Authorities of combining the appointments of Medical Officer of Health and of Public Analyst in one. But very few Medical Officers have the chemical knowledge to become efficient Public Analysts. There are some brilliant exceptions, such as are afforded by the President-Elect, and by our Past-Presidents, Drs. Adams and Hill; but as a rule the average Medical Officer is not capable of doing the work of the Public Analyst in a manner creditable to himself or to the chemical or the medical professions. We Public Analysts have quite enough to do to keep up with the advances in chemical knowledge, and the Medical Officer has quite as much to do to keep abreast of Medical science. The Local Authorities who thus combine the appointments do so solely for reasons of so-called economy. They want to force the Medical Officer to do also the work of the Public Analyst without any, or without adequate, remuneration. One large town in the Midlands obtains analyses of seven or eight hundred samples per annum, representing a value of seven or eight hundred guineas, at the expense of the salary of an assistant to the Medical Officer of Health. This is intelligible from the "Vestry" point of view, but cannot be fair to the chemical or the medical professions. I have every reason to know that the best section of the medical profession is opposed to such a mischievous practice by Vestries and Councils, and would be very glad to see it put an end to. I am sorry to say that the correspondence which we have had with the Local Government Board has not so far led to asatisfactory result, but we shall continue our efforts in this direction. Ignorant Vestries and Boards may honestly think that a medical man may in cases be an efficient Public Analyst, but those of us who have had to do with the training of the medical student must know otherwise. In the end, no doubt, the separation of the two appointments will be obtained in every case. But it is essential that we, who are Public Analysts, shall show that we do represent a profession, that we are not mere amateurs, but life-long students, and that we will not do the work unless we are recognised as the medical profession *is* and *has* long been recognised. We may at present be paid like policemen or sanitary inspectors, but if each of us determines to be the authoritative adviser of his appointing authority without fear or favour, surely the time must come when we shall be listened to with as much respect as the medical officer is. Our work represents to the country the protection of monetary and other interests amounting to the greater part of the nation's earnings, and until we estimate ourselves at our proper value we must not wonder if Vestrymen and Councillors do not think highly of the services of the Public Analyst. Your council have felt that by the admission of unqualified men into the ranks of the Public Analysts the aim of the Society has been retarded, and they have given their serious attention to the

question of instituting a qualifying examination by which the knowledge of any candidate may be judged. In Canada, no analyst can be appointed until he has undergone examination before a special examining board appointed by the Governor in Council, and until he has obtained from such board a certificate setting forth that he is duly qualified to perform the duties attaching to the office of analyst (the Canadian Adulteration Act 48-49 Vict. c. 67). In England, the Vestry or the local Council is the judge of the qualification of the Analyst, and the Local Government Board confirms, I believe, in every case where no special objection is lodged and sustained. But in order to obtain a colourable qualification, intending candidates for the post of Public Analyst become members either of this or of the Chemical Society, although the membership of either at present in no way shows the qualification of the member. Although the deliberations of your council have not yet been carried to a conclusion, I am sure all qualified members of the Society will hope that ere long a scheme which will afford a means of showing the qualification of each Public Analyst will be properly worked out and enforced. It cannot be in anybody's interest to see inefficient men, or such as have gone through a few weeks' course of drilling in the laboratory of an Analyst, appointed to official and responsible positions; men who can perhaps mechanically make an analysis, so-called, of milk or water, but whose opinions are not worth having when given. Nothing but proper study, spread over years, can give the necessary knowledge and qualification. The Institute of Chemistry, which ought to be the proper qualifying body, has a Charter which does not admit of our objects being carried out under it, and, in my opinion, and in that of the majority of your Council, this Society owes it as a duty to the public and to its members to undertake the work to which I have referred. It must be remembered that the Analyst, once appointed, is the sole official chemical authority for a district, and the public have to go to him, whether he be competent or not, for advice and chemical help. Until, therefore, there is absolute security that the Analyst is really efficient, the confidence which ought to be reposed in him will never be generally established. I sincerely hope that we shall have the hearty support and co-operation of the Society in bringing about this much-needed reform.

For many years, indeed ever since the passing of the Food Act, the relations between Public Analysts and Somerset House have not been of that cordial character which, in the public interest, should obtain between officers working under the same Act of Parliament. The Somerset House Chemists undoubtedly fulfil one most useful function, namely, the correction of errors of analysis, which must, unavoidably, occur now and then, and against which there must necessarily be some authority to refer to. In the early days of the working of the Food Act, when experience was small, it was also well that some check should exist to prevent incorrect and unwarrantable conclusions being drawn from analytical data. It is to the credit of Dr. Bell and his colleagues that they have thus proved to be the regulators, as it were, of the analytical machine. Had it not been for the check thus imposed by Somerset House, our methods of analysis (especially of milk, which for years was analysed by a very bad and unscientific method of analysis) would

probably not have become what they are at the present time. But having said this, I regret that I cannot go further and credit Somerset House with any measure of cordial co-operation in our work. Upon Public Analysts alone has fallen the work of elaborating chemical methods, although, as I have taken occasion to point out before this evening, it is no function of theirs to supply the methods of analysis necessitated by their work. Upon them, also, has fallen the great labour of elaborating, upon the basis of an enormous number of analyses, the standards and limits from which to judge of the purity or otherwise of any articles submitted to them for analysis. They alone, not only unaided, but thwarted by Somerset House at every turn, have had to uphold satisfactory standards of quality for important articles of food, such as milk. When analysts of large experience find their views opposed by referees, doubtless acting from a strong sense of duty, but who have not one tithe of their experience ; when they see that instead of what they believe to be broad and just views being taken, exceptional samples, which we all acknowledge to occur now and then, are ferretted out and held up as patterns whereby all other articles of the same class are to be judged ; when they further see that conditions which are justly imposed upon them by the Act, referring to the state of the samples when analysed, are set at nought by the referees, it cannot well be wondered at that, with all desire to work in harmony for the public weal, they have not accustomed themselves to look upon Somerset House with any great amount of pleasure or enthusiasm. In the first years of the working of the Act, collisions between Public Analysts and the referees were frequent, not often resulting in favour of the correctness of the views of the latter ; but gradually a settled state, of what I cannot describe otherwise than despair at a hopeless state of things, took hold of analysts, and they, against their better knowledge and belief, shaped their certificates in accordance with the views prevailing at Somerset House. Samples of milk and of butter were and are daily passed as genuine, which the analyst honestly believes to be adulterated, but which he cannot venture to condemn because he knows that, on reference to Somerset House, they would be pronounced to be genuine, or at least certified upon in ambiguous terms. The analyst came to the conclusion that it was not only useless to uphold his own views and to certify accordingly, but that it was injurious to the public interests to place himself in a position from which the authority of the referees might dislodge him and discredit the working of the whole Act. If, instead of milks being passed, as they daily are, with 2·5 per cent. of fat. or 8·3 per cent. of solids-not-fat, analysts, with the cordial support of the referees, had condemned them, the whole country would by this time be the gainer ; bad breeds of cows would have vanished, injudicious feeding would have been given up, adulteration as a fine art would not have become possible, and every honest milk dealer would have rejoiced. If American States can pass laws laying down a minimum of twelve or twelve-and-a-half per cent. of total solids for milk as in Wisconsin, New Jersey, Minnesota ; or, like Massachussetts, give the standard set by the "British Society of Public Analysts" the sanction of its law ; or forbid, like Pennsylvania, the feeding of cows with distillery

waste, it appears very remarkable, to say the least, that we, the analysts of the country that passed the first anti-adulteration laws, should be debarred, by the action of Somerset House, from adhering to our own limits, limits which are followed by analysts over the rest of the civilised world. I am firmly persuaded that had it not been for the circumstances to which I have referred, we should long ago have done better, instead of worse, than the States to which I have referred. But, as I have stated, we resigned ourselves to what appeared a hard fate, until some months ago the Council of the Society once more made an effort to induce Dr. Bell to abandon the position which his department had taken up. We addressed a letter to him, which was signed by almost every Public Analyst of standing in this country, and by other members of the Society interested in the Sale of Food and Drugs Act, and which, therefore, may be taken to contain the almost unanimous expression of opinion of all British Public Analysts. We asked, in a respectful manner, that the form of certificate issued by Somerset House, which, while presumably intended to be unbiassed and judicial, had really a most harmful effect upon the magisterial benches to whom the certificates were addressed, should be abandoned, and that in doubtful cases Somerset House should state frankly that the results were compatible with the views taken by the Public Analyst; and that, in fact, a straightforward position should be taken up, without favour to anyone, either be it the trade or the analyst. We asked, further, that the practice of analysing milk which had, in consequence of keeping, undergone deep changes in composition, should be definitely abandoned. The public analyst is obliged, by the schedule appended to the Act of 1875, to say specifically whether the article, when analysed, had or had not undergone any changes that might interfere with the results of the analysis. Should the analyst state that a sample of milk analysed by him was decomposed, had fermented, or even become sour, would any bench in the kingdom condemn a vendor upon the analysis of such a sample? But Somerset House, though working under the same Act as ourselves, consider that they are not bound by the schedule, and habitually analyse milk which no Public Analyst who values his reputation would touch, much less certify upon. This was the essence of the letter which has been in the hands of each one of you. I much regret that Dr. Bell has not seen his way to accede to our requests, and that, as to the first point, he declines to alter the form of his certificate, and that, as regards decomposed milk, he alleges that he never analysed any milk which was, in his opinion, decomposed past satisfactory analysis. I need but state these facts, without much personal comment of mine, to bring you to the conviction that Dr. Bell has not well understood his duties to the public, or his obligations to his co-workers under the Act. We have cases on record in which the analysis of a milk when fresh, conclusively showed, upon the Somerset House limits themselves, that watering had taken place, but in which upon being analysed at Somerset House after a lapse of some weeks, was returned as genuine: the decomposition undergone by such samples had been smaller than usual, if one can speak of a "usual" amount of decomposition, and hence the constant allowance added to the analytical figures brought

up the solids-not-fat too high, and thus made the sample appear genuine. We have had at least one other case, in which the decomposition was greater than it ought to have been according to Dr. Bell—greater, I feel tempted to say, than the *official* amount of decomposition—the result being that the unwatered sample was declared to be watered by the referees. But it requires no cases and no argument to show how entirely fallacious any set time allowance must be, even if every pains are taken to estimate the amount of acidity and of alcohol produced during keeping. We cannot prescribe the number and kind of organisms which determine the extent and kind of decomposition, and the circumstances vary in every single case.

Yet we should not allow ourselves to fall into a state of hopeless despondency at such a sorry state of matters, for indications are not wanting that the public themselves are tired of the condition of things produced by the attitude of our referees on the one side and of 150 or more Public Analysts on the other. We would gladly bow to the decisions of chemists of acknowledged scientific authority; but when we believe, rightly or wrongly, that many Public Analysts have more experience and knowledge of the subject of food analysis than the referees, we are bound to make every effort to bring about an alteration. It would, of course, be far better, and in thorough harmony with our wishes, if such alteration could be effected by mutual consent; but if this be impossible, as I personally believe it to be, it is our duty to work for the best obtainable state of things, without regard for the sensibilities of individuals.

The defects of the Food Act, and the hardships which it entails to the retailer, have been largely discussed by the provision trade during the past year, and it must be very evident even to the casual observer, that changes must and will be made in the law as it now stands. No workable means have yet been proposed. There is much dissatisfaction among retailers, in that upon them falls all the burden and punishment for the sale of an adulterated article, although the offence may be, and in many cases is, entirely due to the wholesale house or to the manufacturer. In the case of proprietary articles, which are sold in packets, the contents of which cannot be interfered with by the retailer, there cannot be any good reason why the summons should not be made returnable against the manufacturer or the wholesale house instead of against the innocent retailer, as soon as it is proved that the latter sold these articles in the same state in which the wholesale house supplied them. But in the case of articles sold loose, which afford no proof of identity, such as milk, butter, cocoa, coffee, pepper, &c., the matter is far more difficult. It is hard upon the retailer to be summoned for an offence which he has not committed and against which he cannot well guard himself; on the other hand, the wholesale dealer cannot and will not take upon himself the responsibility for loose articles when they have once passed out of his hands, for he has no means of assuring himself that the retailer has not himself tampered with them, or substituted others for them. Between the retailer and the wholesale house any prosecution would be sure to fall to the ground if divided responsibility were accepted, as is now often urged by the trade.

If then, as it appears on all sides, an alteration in the law is demanded, namely, by the public, who urge that in many cases the law is a dead letter, and that there are no means of enforcing it; by the retailers, who justly complain that the law is all against them, and that it saddles them with responsibility which often should lie with others; by Public Analysts, who are handicapped in every way, hampered in their work, ignored by their appointing authorities and by many members of the bench; and by vestries and county councils, who when they do work the Act, often do so most unwillingly and fitfully, it may be pardoned me if, as your President, I also venture upon a number of suggestions, the outcome of a good deal of thought and experience, in which I have endeavoured to embody all that appears to me best of the many suggestions made by vendors and others interested in the matter. For, after all, the analyst, through whose hands go the samples of a number of counties, under the present Act representing widely varying circumstances—and who, at the same time, is often in intimate contact with the trade, and listens to the many suggestions and complaints made to him—must know better where the shoe pinches than the representative of any single interest or any single member of Parliament, who relies, perchance, upon the representations of some sanitary inspector. But, knowing that many interests are involved, I bring forward my proposals solely as suggestions, in the hope that some of them, at least, may be of use.

The want of uniformity among analysts and in the working of the Act is continually commented upon. This Society has done its best to induce its members to take up as uniform and reliable methods of analysis as the present state of analytical science allows, and it has, I think, fairly well succeeded in this. But there are hardly two authorities in the country who work the Act uniformly and consistently. Times out of number has the Local Government Board pointed out that, while in some cities or counties the utmost vigilance and even severity is shown, in very many others the Act is not worked at all, the officers being appointed with the full intention of not utilising them at all. The first thing necessary, therefore, is a central authority, which should not only be able to grumble, like the Local Government Board, but also to enforce. Whether this central authority be the Local Government Board or the Ministry of Agriculture matters not much, although a good deal is to be said in favour of the latter department of the Government, as adulteration affects agricultural interests far more than ordinary commercial ones. But I will assume that the Local Government Board, as hitherto, would be the guiding authority for the working of the Act. In order to enable that Department to give due weight to its recommendations it should, as in the case of medical officers of health pay part, say one-half, of the expenses of carrying out the Act, and receive an equal share of any fines which may be imposed or of other monies received. There should be a Chemical Officer of the Local Government Board, precisely as there are Medical Officers of the Department, who advise local authorities in all cases of difficulty, and who help and guide the Board and its officers. The chemical officer of the Board would also have the responsibility of any chemical matters that might come before the Board, such as water supply

sewage treatment, poisoning cases, &c., which matters are now, though largely chemical, left entirely in the hands of medical advisers. It is time that the Chemical Profession should be distinctly and not merely very indirectly represented in a Government Department. Such an officer would be solely an adviser, not a practising chemist. He would have to be a man of authority, whose word and knowledge could be relied upon, and whose work would be recognised by all sections of chemists throughout the country. He should not be chosen, as Somerset House has been chosen, solely for the sake of cheapness and convenience the Inland Revenue Laboratory being the only Government laboratory which existed at the time the Food Act was passed. The chemical officer should select a number of analysts and other chemists as assessors, chosen for their special knowledge in the various departments of chemistry coming before the Local Government Board, but who would not be permanent officers. This Chemical Board would have to issue in the form of regulations, alterable from time to time, standard methods of analysis to be followed by the Public Analyst, for all must have recognised by this time that figures obtained in food analysis depend largely upon the precise details of the method of analysis followed, and that all standards and limits which have been or may be fixed can be based solely upon definite modes of procedure. They would also have to lay down limits and standards for various articles, to be altered by regulation as any material advance is made in our knowledge. Other Governments have adopted this course. The Swedish and German Governments, for instance, not unfrequently issue regulations for the guidance of the analysts working under their laws, with precise and even the most minute details. No method of analysis and no limit should be embodied in any Act of Parliament, for Acts of Parliament are rigid and require years of agitation to get them altered, if the necessity for alteration arises. Any analyst devising a new and perhaps improved method of analysis would bring it before this Chemical Board in the full confidence that it would be fully and fairly considered, and without the fear of seeing printed in parliamentary blue-books reports totally at variance with the expressed opinions of the chemical advisers, as in a case within my personal knowledge.

This chemical officer, being in contact with all similar departments of Governments throughout the world, would be in a far better position to know what was going on in other countries than Public Analysts, and would be able to give early intelligence of new forms of adulterations springing up abroad. Had we had such a central guiding officer, the adulteration of lard with cotton oil, for instance, which flourished for some years before an English analyst found it out and brought it into general notice, would have been scotched much sooner than it actually was, for the American Government had the matter actually under consideration before we English analysts were aware even of the addition of cotton oil to lard.

If the Local Government Board paid part of the expenses of executing the Act we should get rid of two of the weakest points of the Act, namely the insufficient number of

samples taken by some authorities and the beggarly fees sometimes paid. The matter is not, let me plainly say, a money or fee question at all, but every labourer is worthy of his hire, and the Public Analyst having scientific and responsible work to perform, should not have to battle with some well-meaning, but intensely ignorant authority, consisting perhaps of dairy-farmers, who have heard that somebody or other analyses milk for a trumpery fee and forthwith expects the Public Analyst to do the same. Many Public Analysts, especially local men, with not too much of worldly goods and dependent largely upon their official work and what hangs around it, unwillingly give way, and the result is that the work is done at fees which are not sufficient to cover the salary of the laboratory boy, with the immense amount of responsibility thrown into the bargain. I cannot think that a professionally-advised Board would encourage this sort of thing. We should, secondly, get some uniformity in the number of samples analysed in various districts. Year after year the Local Government Board Reports show that certain towns and districts set the Act at defiance. In London, St. Martin's-in-the-Fields, in the country, Herefordshire, West Suffolk, Montgomery, and Radnorshire did not take any sample at all in 1891, nor did no less than 27 boroughs, all branded by the Board, without avail, as malefactors to their inhabitants. And there are quite a host of other towns where the number of samples falls altogether short of reasonable requirements. It is not too much to expect, surely, that one sample should be taken for every 1,000 inhabitants, as the Local Government Board recommends. To my thinking, a better mode of proportioning the work, would be to regulate the number of samples taken by the number of vendors of articles of food and drugs existing in each district. In towns the proportion of these is larger than in rural districts. Were there few vendors of food in any district it would be unreasonable to require many samples to be taken. From the census of 1881, the latest one available, I have compiled for some boroughs and counties in which I am specially interested the number of such vendors. Thus in Nottingham there is one vendor to every 41·11 inhabitants, in Nottinghamshire one to 47·96, in Derby (borough) one to 41·61, in Derbyshire one to 53·99, in Sussex one to 37·22. Assuming that to each establishment belong four persons on the average, I calculate that in Nottingham there are 1,136 establishments for the sale of food, drink and medicines, in Nottinghamshire 2,286, in Derby 488, in Derbyshire 1,789, and in Sussex 3,569. At the rate at which samples are at present collected and submitted to analysis in these districts a lifetime almost must elapse before each vendor is reached even once, that is to say, till one sample only be taken from each separate establishment. And when it is considered that each vendor deals in a number of articles, almost daily renewed, which are liable to adulteration, it should be obvious to the meanest understanding that the present working of the Food Act is utterly absurd and stupid, and that the small measure of moral influence produced is at least counteracted by the immense chance of non-detection. And if the Local Government Board cannot enforce its recommendations there is no hope whatever that the present state of things will be materially altered.

I would further put into the proposed Act, that the Public Analyst be chosen as hitherto by the local authorities and approved by the Local Government Board, with the understanding that only such men be appointed as have proved themselves to be qualified for the work. At present these things are managed by the very objectionable system of testimonials. I have seen testimonials given to candidates, by men who could not have the faintest knowledge of the duties of the Public Analyst; by professors, eminent in their departments, but not analysts; by medical authorities; by members of Parliament; and others. If the examination scheme, which I alluded to earlier in my address, were passed, as I hope it will be, and recognised by the chemical adviser of the Board, we should have the assurance that whatever the local influence of any candidate might be, (and local influence will always remain an important factor,) no inefficient man, no mere amateur, would be appointed. Even the most competent man *may* make a mistake, and where many samples are annually analysed there *will* always be a few mistakes, but no cases of gross incompetency—which give all opponents of the Act an excuse for crying out against the whole system of food examination—would occur.

Proper officers should be appointed whose duty would be the collection of samples. At present, police inspectors, well-known to every inhabitant of their districts, are largely employed. Police officers have their hands quite full enough with other work, and only undertake sample collection with great reluctance. Sometimes inspectors of nuisances or inspectors of weights and measures are the collecting officials, but these also, admirably as some of them perform their work, are full of other, and to them more important and congenial work. It would be as unreasonable to expect police officers to be inspectors of nuisances, or inspectors of weights and measures to perform detective work, as are the present requirements of otherwise occupied officials. The mode of collecting samples might otherwise remain the same. The division into three parts is just and fair, but the vendor should have the right of appending his own seal also, together with that of the inspector to each part of the sample. No single individual should have the responsibility thrust upon him of holding another man's reputation in his hands. Special regulations, binding upon all inspectors, should be issued by the chemical officer of the Board and his assessors for the proper putting up of the collected samples. At present samples are often secured in the most flimsy manner. I have had samples which could be readily removed from their packages without the breaking of any seal. I have seen coffee and mustard packed in papers which had soaked up much of the fat, so important to the analyst; spirits in wide-mouthed bottles with ill-fitting and porous corks, allowing of any amount of evaporation; I have had samples wrapped in arsenical paper, samples insufficient in quantity, like four ounces of beer, and monstrosities of all kinds. At present there is no means of regulating all this: each officer acts as he likes and sometimes resents any attempt at interference. There should, further, be special regulation, as to the division of samples like seidlitz powders, medicines, and aerated

beverages, which at present cannot be divided under the Act without rendering analysis impossible. The principle upon which the Act should be founded should be, that every purchaser should obtain the precise article for which he asks, unless he is distinctly and clearly informed at the time of the purchase, that the article demanded is not kept in stock. A mere label, therefore, should be no protection to the vendor if the label is not in accordance with the demands of the purchaser. Verbal notice should be given in every case, for some people may not be able to read, and others may not read the label at all. If, in my household, the servant is sent to the butterman to get some butter, it is no use to me if the grocer sends margarine with a label intimating the fact. The servant does not bring the wrapper every time to me for my inspection. People may at first be offended if the grocer says that he has no tenpenny butter, but only margarine at the price; they may like to appear to be buying butter, when all the time they wish for margarine, but they would soon learn better, if they found that every trader gave them the same kind of notice. But if a label be appended to an article, I would hold the tradesman responsible for the accuracy of the description on the label. It is, I am told, the habit of some establishments to wrap all butter or margarine in margarine wrappers, to go quite safely under the present Act. I would punish a vendor for selling pure butter in a margarine wrapper, because the practice is plainly one intended to cover every fraud upon the ignorant and unwary. All mixtures should have on the label the proportion of the ingredients, excepting in the case of proprietary preparations, which may be composed of substances or made up in proportions which it might not be fair to require to have stated. But in these cases I would let the vendor omit to state the constituents and their proportions at his peril and on his responsibility. Every third portion of each sample taken, should, as at present, be retained by the inspector. In the case of milk, the only article so perishable that, if any check analysis is to be made, it must be made quickly and before decomposition has set in, I would make it incumbent upon the analyst to report within one week, or even within four days of the receipt of the sample, a report to be sent both to the inspector and to the chemical officer of the Local Government Board if it is found to be adulterated. In that case the inspector would immediately forward his portion of the sample to the Chemical Officer of the Board, by whom it would be preserved by heat sterilisation, or be opened in order to receive a proper amount of some preservative like chloroform, carbon disulphide, potassium bichromate, or other suitable antiseptic in exactly ascertained quantity, and there again sealed up for reference if required, should a dispute arise. In that case the sample would be sent to one of the Chemical Officer's assessors, a man specially experienced in milk analysis, and who could speak on the matter with authority, to be analysed by him; provided always that the assessor should not be interested in any way in the particular case. If, therefore, the assessor were a Public Analyst, as would be probable, no samples from his own districts could be sent to him for reference, and therefore for each article two assessors would have to be appointed, one as principal, the other as deputy in cases such as that referred to.

If a dispute arose in any other article, the sample would also be sent to the Chemical Officer, and would be placed by him in the hands of another suitable referee. In this way each article would be judged under the recognised rules of the department as to method of analysis and standard adopted, by men specially experienced in each special article. I would, for instance, rather have a drug referred to Dr. Muter or Mr. Davies, a sample of wine to Dr. Dupre, one of oil to Mr. Allen, one of milk to Dr. Vieth, Mr. Richmond, or Mr. Faber, than any of these to the present referees without special experience in any single department. Thus we should once and for all get rid of unseemly disputes, and the trades as well as the analyst would have due protection and the best advice obtainable. The summons should in every case be returned against the actual vendor, who, if he alleged that he did not commit the offence or acted in ignorance, might be required by the Act to state this to the Inspector serving the summons, whereupon for the vendor's protection the Inspector would take a sample of the same article next delivered to the retailer by the wholesale house, before it was touched by the retailer, obtain an analysis which, if it proved unfavourable, would exonerate the retailer, but would incriminate the wholesale dealer, while in the contrary case the retailer would be summoned for the former sample and punished. As the wholesale house would be quite ignorant of the result of the first analysis, they would have no chance, should they really be the guilty parties as alleged by the retailer, of sending a specially pure article, and the retailer would not only have no interest, to put the wholesale dealer upon his guard, but the contrary, as he would make the punishment come upon himself. In this manner, I think, the retailer as well as the manufacturer would be duly protected, at the least possible inconvenience to himself or cost to the authorities. No firm given to adulterating their goods does so only occasionally, but rather as a matter of principle and daily, in the hope, which is at present but too often realised, that the fraud will not be detected, seeing that the Inspector can come but very rarely indeed. On the other hand, mistakes which may occur in the best-regulated businesses, such as the accidental substitution of margarine for butter, would be more or less distinguished from intentional fraud.

I know, that in many minds there is an objection against any form of centralisation, and justly so, but, having regard to the working of the decentralised Food and Drugs Act during the last seventeen years some such plan of semi-centralisation appears to me to be the only solution of a remarkably difficult problem. Nothing certainly could be worse than the present system of making every individual analyst the judge of what ought and what ought not to be allowed. There are sometimes reasons, which cannot be known to the analyst, why certain admixtures should be made to food or drink, which can now only be brought forward at the expense of a law case, involving the reputation of honest firms, or the good name and repute of the analyst. Such cases would come first under the notice of the Chemical Board, and due allowance would be more likely to be made for trade requirements than is the case at present.

I fear I have tried your patience to the utmost extent, but the importance of the subject to many outside this Society, as well as to its members, must be my excuse.

I now take leave of you as your President. I thank you one and all for the unvarying courtesy and friendship shown me during the two years I have had the honour of presiding here, two years which leave nothing but pleasant memories with me. It has been a great pleasure and satisfaction to me, who have worked for so many years as an active member, to see the Society increase in numbers and in standing, and I hope I have to some measure, at least, justified the promise I made two years ago, that the interests of the Society would be watched over by me jealously and to the utmost of my power.

Sir Charles A. Cameron, in proposing a vote of thanks to the President for his address, said there was not a single sentence in the valuable address to which they had listened—except that relating to the proposal to institute diplomas in connection with the Society—which would not have the cordial assent of every member. Perhaps that was the only vexed question the President had touched upon, but he thought they would all heartily agree with the other proposals in the address. He thought Mr. Hehner had shown them all the difficulties under which Public Analysts laboured, and that he had thrown out a number of valuable suggestions which he (Sir Charles) hoped would be incorporated in whatever future Act of Parliament might be passed in reference to the adulteration of food and drugs. He thought the thanks of the Society were due to the President, not only for his address, but also for the great zeal and interest he had exhibited in the welfare of the Society during the two years he had had the honour of being its President. He (Sir Charles) regretted that he could not often be present at the meetings of the Society, and therefore could only repeat what he had gathered from his friends who were members of the Society, as to the close attention Mr. Hehner had given to his functions during the last two years. From every quarter he had heard that their President had been unremitting in attending to the duties of his office, being invariably present at all the meetings of the Society, and the meetings of the Council and sub-Committees. He therefore ventured to say that they would remember for many years the presidency of Mr. Hehner, because, not only had he been an admirable President from a purely scientific point of view, but his pleasant and practical method of discharging the duties of the chair was such as to commend him to their gratitude and thanks. His address had not only been a very suggestive one, but the numerous references he had made to certain points had caused them, notwithstanding the low temperature of the room in which they were assembled, to "warm-up" a little. He had great pleasure in proposing that the heartiest thanks of the Society be tendered to Mr. Hehner for the admirable way in which he had discharged the duties of President during the last two years, and for the valuable and suggestive address he had delivered that evening.

Mr. Alfred H. Allen, in seconding the vote of thanks, endorsed the complimentary references which Sir Charles had made to Mr. Hehner's services as President, and in alluding to one or two points raised in the address, suggested that that was not the occasion for discussing them, as their time that evening was limited. He thought it would be profitable if the Society devoted its next meeting, even if they did not have a special meeting, to discussing the address further. They could then have the propositions in print and would be able to consider them in detail. Certainly they should not be allowed to drop. The vote was then put to the meeting and carried by acclamation.

The President, in acknowledging the compliment, referred to the diploma question. He said he knew the subject bristled with difficulties; the more they looked into it the more hopeless it seemed to be to satisfy everybody. He thanked Mr. Allen for his suggestion, though he would not take it as an indication that anything he (the President) had said would necessarily be received with approval. He cordially welcomed the suggestion in view of the immense importance which the subject was likely to have in the future. It would be a misfortune if members of the Society came with conflicting views before a Parliamentary Committee.

The next business before the meeting was the election of the Officers and Council for the new year, and, the nominations submitted to the members having been opened and examined by the scrutineers, the following gentlemen were declared elected :—

President—Sir Chas. Cameron, M.D., F.R.C.S.

Vice-Presidents (who have filled the office of President)—M. A. Adams, F.R.C.S.; A. H. Allen; A. Dupré, Ph.D., F.R.S.; Otto Hehner; Alfred Hill, M.D.; J. Muter, Ph.D., M.A., F.R.S.E. (Who have not filled the office of President)—Charles E. Cassal; Sidney Harvey; Thomas Stevenson, M.D., F.R.C.P.

Treasurer—C. W. Heaton.

Hon. Secretaries—R. H. Davies, Bernard Dyer, D.Sc.

Other Members of Council—C. M. Aikman, M.A., B.Sc., F.R.S.E.; R. Bodmer; William Chattaway; John Hughes; E. W. T. Jones; H. Droop Richmond; Alfred Smetham.

The names of those Members of Council whose term of office has not yet expired, and who consequently do not retire this year, are T. Fairley; W. J. Sykes; F. L. Teed; E. W. Voelcker; and C. R. A. Wright.

Mr. Hehner formally retired from the chair in favour of the newly-elected president, Sir Charles Cameron.

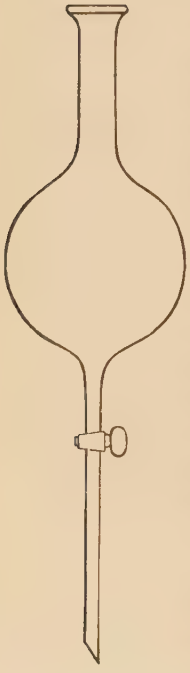
Sir Charles Cameron acknowledged the honour conferred upon him in suitable terms, and, in alluding to the regularity with which his predecessor had attended to his duties, pointed out that his (Sir Charles') residence beyond the Irish Sea precluded him from hoping to follow his predecessor's example in that respect so well as

he should like. He was sure, however, they had fully considered the circumstance when they asked him to accept the post of president, and he could only attribute the kindness they had thus shown him not merely as a compliment to himself, but to the members of the Society resident in Ireland. He could only say that he very highly appreciated the compliment they had paid him in selecting him as their President, especially as the number of members of the Society resident in Ireland was not large. He should do the utmost that was in his power to attend the meetings of the Society, and he might tell them this much, that if ever a channel tunnel were established between Holyhead and Kingstown, or, as it had been proposed, between the north of Ireland and Scotland, he was such a bad sailor that he should always prefer to either ride across the channel through a tunnel or across it by some organised system of ballooning. He should then be one of the most punctual members of their Society, but, as he was afraid next year would not see any such improved means of communication between the two countries, he should content himself by looking at the weather charts throughout the year, and when a period of calm coincided with a meeting of the Society, they might be sure he would turn up.

The following paper was then read :—

THE ESTIMATION OF INSOLUBLE FATTY ACIDS.

By Charles E. Cassal.



The use of a filter in the process of washing insoluble fatty acids in the analysis of butter and other fats is cumbrous and presents numerous and obvious sources of error. In carrying out this estimation I have for several years employed a form of separator which renders the use of a filter paper quite unnecessary, and at the same time enables the washing to be done in a far more thorough and satisfactory manner. In the form in which it was originally used, the separator was a pear-shaped vessel of rather thick glass, provided with a tapped tube with a narrow bore; but the apparatus that I have used for some years past is globular, is made of thin glass, will stand boiling water, and is provided with a tap and tube of wider bore, the end of the tube being cut off at an angle. The older form was more liable to break, and did not always allow of the fatty acids being obtained in a thin layer, which is, in many respects, a great advantage; nor of the greater part of the acids being easily removed from the apparatus without the aid of a solvent.

In using the apparatus, the soap obtained from any convenient weight of fat, but preferably from about five grammes, is poured into strong hydrochloric acid previously introduced into the separator, the residual soap being washed in through a funnel with boiling water.

The resulting fatty acids are washed with successive small quantities of boiling water, the globe of the separator being about half-filled each time. After the decomposition it is necessary to allow the mixture to stand; the major portion of the insoluble acids appear, of course, as an oily layer on the surface of the liquid, but a very marked proportion is distributed through the latter and makes it more or less turbid. Hence it is convenient so to time the work as to allow of the first mixture standing over night. This always ensures complete separation, and subsequent washing does not reproduce the turbidity. The washing being completed, the last wash-water is run off, and the insoluble fatty acids, which are, of course, in a liquid state, are received directly into a weighed vessel, preferably a deep and light platinum basin. The portions adhering to the sides of the apparatus are then washed down with ether, the latter evaporated, and the acids dried to constant weight. The apparatus will be found useful for several other operations.

Three other papers were postponed owing to the lateness of the hour.

The meeting then adjourned to the Criterion Restaurant, where the Annual Dinner of the Society was held. About fifty members and friends assembled. The chair was occupied by the newly-elected President, Sir Charles Cameron, supported by—Mr. Otto Hehner (past President), Dr. James Bell, C.B., F.R.S., Captain Verney Cameron C.B., R.N., Dr. F. Allan, Surgeon-Major Carte, Dr. Cory, Dr. Abraham, Surgeon-Captain Jackson, Dr. Kennedy, Mr. A. H. Allen, Mr. C. E. Cassal, Dr. Sykes, Mr. E. W. Voelcker, Mr. R. H. Davies (Hon. Sec.), Dr. Bernard Dyer (Hon. Sec.), Mr. Aubrey Rake (Solicitor to the Society), &c.

The Chairman proposed the toast of the Queen, the Prince and Princess of Wales, and the rest of the Royal Family; and that of the Navy, Army and Reserve Forces, the former being responded to by Captain Cameron. Surgeon-Major Carte replied for the Army, and Captain Cassal for the Reserve Forces.

The Chairman proposed the toast of the evening: "The Society of Public Analysts," coupled with the name of Mr. Otto Hehner, ex-President, to whom he referred in very flattering terms.

Mr. Hehner said the Society had for seventeen years worked very hard for the welfare of the community under circumstances which would have disheartened most other people. When, twenty-one years ago, the Adulteration Act of 1872 was passed, and the fiat went forth that there should be a body of gentlemen appointed as Public Analysts, there were no practical means of carrying out the requirements of the Act, and although they were asked to make analyses of foods and drinks they had practically no means of doing so. They knew now that twenty-one years ago they were intensely ignorant, and knew nothing of such matters as milk, butter, bread, and drugs; but the Society had laboured year after year in connection with these subjects, and members from all corners of the country had read a great many papers. They were, he thought, in a far

better position now than they were before. In the seventeen years the Society had existed its members had read 450 papers on every possible subject of their work, and, besides that, 150 papers had been published by members in the Society's Journal. This constituted a mine of information for all those who worked in that direction, and especially for Analysts all over the world, for this country was the first to take action in the matter, and the Legislatures of other countries had followed its lead. Seventeen years ago 20 per cent. of the articles analysed were adulterated, now the percentage was about 11. As to the quantity of adulteration then practised, it was appalling—milk would be found to have 50 per cent. of added water; bread had any amount of alum in it; and spirits were watered to any extent. Now, however, there was a general decline in adulteration, and thus the Public Analyst had saved the public millions of pounds, and inasmuch as the larger portion of the Nation's earnings were spent in food, the importance of their work was manifest. But as the Analysts had made advances in knowledge, so had the enemies of the purity of food, and it must be remembered that while the former worked in the light, the latter worked in secret, and had taken such advantage of the increase of knowledge, that at the present time, more than at any other time in the history of the world, adulteration was practised as a fine art. There was, therefore, still plenty of work for Public Analysts to do in coping with scientific adulteration.

Mr. Alfred H. Allen proposed the next toast, the health of the President, Sir Charles Cameron, who, he said, was the senior Public Analyst of the United Kingdom, he having been appointed under the Act of 1860, which was then only a Permissive Act. They might fairly say that Sir Charles had a longer experience of the working of the Adulteration Act than any Analyst now living, and they had, therefore, every reason to regard him as their father so far as experience went in these matters, and as such they cordially welcomed him to the Presidential Chair.

The President in response, referred to his experience as a Public Analyst during the last thirty-one years, and contrasted the conditions under which he had to work during the first part of that period with the altered circumstances of recent years. There was then very little to guide Public Analysts, and there was no awful tribunal at Somerset House to overrule them. So far as Dublin was concerned at the present time, there was hardly anything in the way of ordinary articles of food adulterated, with the exception of butter and milk. With regard to flour, bread, coffee, confectionery, etc., they were formerly adulterated to an enormous extent, but it would be impossible now, he thought, to find any of these things in a sophisticated state in his city. In concluding, Sir Charles referred with satisfaction to the honour that had been done the country he represented, by the fact that quite recently he had not only been appointed President of that Society, but also President of the Sanitary Institute of Great Britain and Ireland, and also of the Institute of Public Health, of which his friends, Dr. Allan and Professor Smith were officers.

Mr. Newlands proposed, in felicitous terms, the health of the Vice-Presidents, the Honorary Secretaries, and the Solicitor, coupling with the former the names of Dr. Adams and Mr. Cassal. The latter in reply spoke of the vast strides made by the analytical profession during the last few years, and said he thought they would look forward with confidence to the time when every member practising in the profession would be regarded as a valuable and honoured servant of the country.

Dr. Bernard Dyer, in responding to the toast of the Hon. Secretaries, referred to the work of the Society during the last nine years, and the labours of his predecessor, the late Mr. Wigner. He referred in cordial terms to the pleasant and harmonious way in which his friend Mr. Davies had, since Mr. Hehner's elevation to the chair, collaborated with him in the Secretarial work. He was sure they all regretted sincerely that Dr. Muter, who had served the Society as Vice-President for many years, and who was a familiar figure at their festive gatherings, was too unwell to be present on that occasion. He had received a letter from their honorary member and Past Vice-President, Dr. Vieth, who was at present resident in Germany, referring to the many happy hours he had spent with the members of the Society when attending their meetings in England, and the pleasure he experienced in receiving "THE ANALYST" from time to time, that being the only paper he had read with interest since he had left the country.

Mr. Davies and Mr. Aubrey Rake having also suitably responded.

The Chairman proposed the toast of the "Guests," coupled with the name of Dr. James Bell.

Dr. Bell, in replying to the toast of the "Guests," said with regard to the President's cordial extension of the invitation to future dinners of the Society, he would be glad to respond at once and affirmatively to that invitation. He had felt a special interest in attending this dinner, for he naturally had very strong sympathies with professional chemists. He knew from experience the anxieties and difficulties they had to contend with, because those anxieties and difficulties corresponded with his own, and they were often great. He hoped that in the not distant future Public Analysts might be placed in a more satisfactory position than they at present occupied in the discharge of their local duties. Local authorities were often bodies whom it was almost impossible to satisfy, and he felt strongly that Public Analysts should be placed in a more independent position. The Society of Public Analysts had a splendid record. It had done a mass of excellent work, embodied in a series of admirable papers; it had devised many excellent processes of analysis, and it deserved the sincere thanks of the chemical profession generally. He wished it to be understood with regard to his official position that he was no conservative. He had followed every important process and investigated every promising method that had been brought forward under the auspices of the Society, and he had never hesitated, as soon as he was satisfied of their usefulness and their accuracy, to adopt such processes. His official position undoubtedly was sometimes a painful one.

He regretted most deeply whenever he was obliged in any point to go against any Public Analyst in a matter of reference. He was glad to say that the great improvements in analytical work had, during recent years, relieved him of an important part of his own anxieties. Out of all the cases referred to him under the Sale of Food and Drugs Act during the last nine months, he was pleased to be able to say that there were only three cases in which he had felt himself obliged to differ from the opinions expressed by the Public Analysts. This, he thought, was extremely satisfactory and he believed that errors were now reduced almost to a minimum. He sincerely congratulated the Society on its progress and hoped it would continue, and as time went on he trusted that they would never have occasion to be apprehensive of the result of references to Somerset House. (Applause).

Dr. W. R. Smith proposed "THE ANALYST," and associated with it the name of its hard-working and energetic sub-editor, Dr. W. J. Sykes.

Dr. Sykes briefly returned thanks, and the proceedings shortly afterwards closed.

The pleasure of the evening was greatly enhanced by selections of vocal music contributed by Surgeon-Major Carte, Dr. Abraham, Mr. W. Bateman, Captain Watson, and other guests and members.

A special meeting of the Society was held at the Chemical Society's Rooms, Burlington House, on January 18th, for the discussion of the retiring President's (Mr. Otto Hehner's) Annual Address.

The Assay of Crude Carbolic Acid. G. Schacherl. (*Zeits. osterr. Apoth. Ver.*, 1892, xxx. 794, through *Chem. Zeit.*)—The usual method of shaking out the phenols with caustic soda is liable to give inaccurate results, as a certain amount of resinous constituents and some neutral tar oil are also dissolved. The plan advocated is as follows:—100 c.c. of the crude carbolic acid are taken if the sample be of poor quality, and 50 c.c. in the contrary case. The measured portion is then placed in a separating funnel and shaken out with 100 c.c. of caustic soda of sp. gr. 1·1, the alkaline liquid separated, and the shaking repeated two or three times with further quantities of 50 c.c. The separated liquid from the last extraction should give no oily drops when acidulated. The combined alkaline extract is then diluted with an equal volume of water, and distilled in a flask of about one litre capacity. When the distillate comes over free from oily drops, the removal of the neutral oils may be considered complete. The contents of the distilling flask are then allowed to cool, acidulated with hydrochloric acid and distilled again, using a large condenser. When the distillate, consisting of phenols accompanied by water, amounts to about 200 c.c., the operation is stopped, and the water separated from the phenols and returned to the distilling flask. The distillation is proceeded with and the collection of the phenols effected as before, the treatment being repeated until the whole of the phenols have come over. The last distillate, which should measure about 60 to 70 c.c., is supersaturated with salt, and the separated phenols read off and their volume added to that of the main quantity. **B. B.**